

Title	THE VIRTUAL MUSEUM OF COAL AND MINING
Level	Middle/High School
Subject	Earth Science / Environmental Science
Duration	30-35 minutes
Objective	Students will be able to describe the following: <ol style="list-style-type: none"> 1. What is coal? 2. What are the types of coal? 3. Where is coal found? 4. Why is coal so important to us?
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➤ **What is coal?**

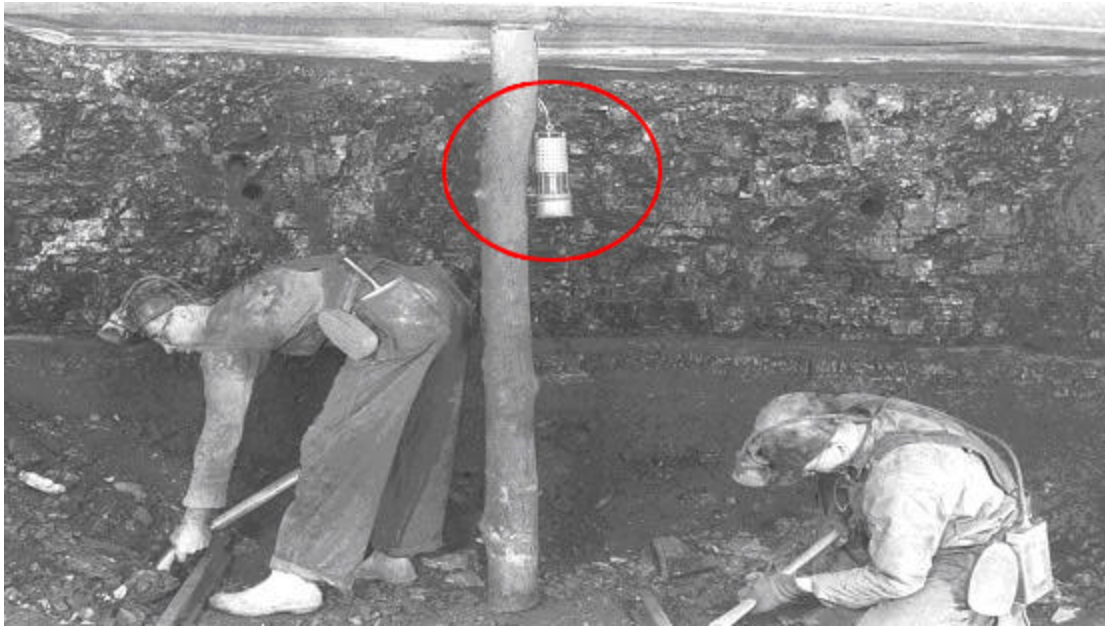
These are just a few questions that you will be able to answer through your journey of the “Virtual Museum of Coal and Mining.” Let us begin by answering the question what is coal? Coal is a sedimentary organic rock that is formed from plants and animals. It is also a nonrenewable source of energy. Millions of years ago, long before dinosaurs existed, plants, trees, swamps, and lagoons mostly covered the earth.

When the plants and trees died, they would fall into swampy waters and form a spongy brown material called peat. Peat is the partially decayed plant matter found in swamps and bogs. It is one of the earliest stages of coal formation. Forces of nature would bury the peat deep under the earth’s surface where more pressure was created by heat. After a substantial amount of time the peat would transform into coal. Not all coal is alike. Coal is classified based on the relative amount of carbon, oxygen, and hydrogen found in it. The more carbon a type of coal has, the higher its rank and the more heat energy it contains.

➤ **The four major types of coal are:**

1. **Lignite** - Brownish black coal with generally high moisture and ash content, and the lowest carbon content and heating value (*heating value of 4,000-8,000 Btu per pound*)
2. **Subbituminous** - A dull black coal with a higher heating value (*heating value of 8,300-10,000 Btu per pound*)
3. **Bituminous** - A soft intermediate grade of coal that is the most common and widely used in the United States (*heating value of 10,000-14,000 Btu per pound*)
4. **Anthracite** - The hardest type of coal, consisting of nearly pure carbon. It has the highest heating value and lowest moisture and ash content (*heating value of 14,000-15,000 Btu per pound*)

Coal mining in the early days was a strenuous, tiresome, and dangerous job. The wooden pole would warn the miners of the ceiling possibly caving in. It would begin to split or crack, letting them know how much time they had to mine in that area. The miners always used a flame safety lamp. It would indicate if there was an abundant amount of dangerous methane gas in the area being mined. (*Lamp is attached to the wooden pole in photo*)



* Photo is from the *United Mine Workers of America* collection.

➤ **Where is coal found?**

Coal is found on every continent, including Antarctica. The United States has the largest supply of coal and minerals. It holds 30 to 35 percent of the world's reserves. Coal is found in 38 states and nearly one-eighth of the country lies over a coal bed. A few of the top coal mining states include Pennsylvania, Ohio, Colorado, Texas, and Indiana. Coal has many uses. It helps to create many products.

Coal has four major markets:

- Electric utilities,
- Industrial/retail users
- Steel
- Exports

➤ **Why is coal so important to us?**

Electric utilities use more than 86 percent of the coal produced. It is the least expensive way to produce energy. Industry and retail users hold second place in the coal market, using coal to make products such as, dyes, insecticides, fertilizers, explosives, medicines, synthetic fibers, synthetic rubber, food preservatives, fingernail polish, and ammonia. The steel industry uses coal to make coke.

Bituminous coal is heated in airtight ovens; the lack of oxygen prevents the coal from burning and converts some of the solids to gases creating coke. Exports are another market for coal in the United States. In one year's time, the U.S. generally exports over 80 million short tons of coal to other countries. The top five foreign markets for coal exports are Brazil, Canada, Italy, Japan, and the Netherlands.

For more information go to link: <http://www.coaleducation.org/> - coal and mining.